IoT-Ready, Energy-Saving Controller
Contributes to the optimization of energy use by enabling monitoring / control of power demand and visualization of production information

- Easy Ethernet data logging
- Visualization using Web server
- Acquisition of analog data using extension function
- Demand monitoring / control function at short intervals of five seconds
- Equipment manager
- Business owner
- Factory manager
Contributes to the optimization of energy use by control of power demand and visualization of production information

The key to successful utilization of IoT is to collect and utilize data. Panasonic has been promoting the use of Eco-POWER METER, data loggers and software for visualization of energy so that effective energy-saving activities can be conducted.

**ELC500 Control Unit**

The ELC500 Control Unit enables program-less Ethernet data logging, demand monitoring and control at short intervals of five seconds, and remote equipment monitoring using a Web server. This product allows the incorporation of IoT in your factories and equipment to help optimize energy use and improve productivity.

**Usability**

**Data logging through Ethernet**

**Remote monitoring using Web server**

**Example of Web server screens**

- Real-time monitoring of equipment operations
- Pareto chart of factors causing equipment non-operations
- Remote monitoring using cameras

**Visualization using Web server**

Remote monitoring of equipment using smartphone or PC

**Program-less** Ethernet data logging and remote monitoring / control using Web server

* Ethernet is a registered trademark of Fuji Xerox Co., Ltd. and Xerox Corporation in the U.S.

Notes:
1) Depending on the type of information to be displayed on the Web server screen, a program may need to be produced using Control FPWIN Pro7.
2) Settings must be made using Configurator EL500.
3) Web content must be produced using Control Web Creator.
### Demand monitoring at intervals of several seconds allows prompt response to sudden load fluctuations

**Before**
- Demand forecast at 1-minute intervals

**After**
- Demand forecast at 5-second intervals

#### Monitoring intervals and control patterns to meet the demand monitoring needs of users

<table>
<thead>
<tr>
<th>Constant-cycle demand</th>
<th>15 min</th>
<th>30 min</th>
<th>60 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELC500 Control Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Logger Light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELC1 Control Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conventional product</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Flexibility**

**Demand time span is compatible with constant-cycle demand periods of 15 / 30 / 60 minutes.**

**IEC demand**
- Compliance with IEC 61557-12 standard

**IEC demand (Sliding block interval and Fixed block interval)**

Users set the time span for demand calculation to an arbitrary value between 1 to 60 minutes (in increments of one minute).

The average power demand within the set span is calculated at the end of the span. [The demand values of active, reactive, apparent, active (export), and reactive (export) power are calculated.]

**Sliding block interval method**
- The next time span starts “n” minutes later. (Value “n” is arbitrarily set by users.)

**Fixed block interval method**
- The next time span starts after completion of the current span.

#### Three types of control patterns

**Alarm-linked control**
- Controls loads in three steps according to conductions such as demand values to achieve peak-cut.
- Users: set demand value in time span T

**Cyclic control**
- Controls a group of loads in a rotation manner to reduce overall power consumption.

**Startup control**
- Delays the startup timing to reduce inrush power and achieve peak-cut.

**Demand monitoring complies with the IEC 61557-12 international standard commonly used for energy-saving measures.**

**IEC demand**
- Demand monitoring complies with the IEC 61557-12 international standard commonly used for energy-saving measures.

**Demand monitoring at intervals of several seconds allows prompt response to sudden load fluctuations**

**Before**
- Demand forecast at 1-minute intervals

**After**
- Demand forecast at 5-second intervals
After
There is no need for a program for serial communication and storage of equipment operation status data.

- Reduces engineering man-hours
- Improves maintainability
- Allows easy change of layout

Visualization of equipment operation information
Comparison of man-hours reduced by retrofitting

Before PLC’s communication program is used for serial communication and storage of equipment operation status data.

- Character string data cannot be managed.
- Maximum data size is four words.

Collection and storage of operation data of existing equipment using add-on device

* Settings must be made using Configurator EL500 (compatible units: Modbus TCP / RTU and MEWTOCOL units). * SD memory card (sold separately) is required for data storage.

Usability

Ethernet data logging makes it easy to incorporate

Extension function(Note) for logging of I/O signals, analog data and temperature data

Before
There is no means to obtain equipment operation status information through communication function.

After
FP7 Expansion Unit enables acquisition of equipment I/O signals, analog signals and temperature information.

Note: To use the extension function, it is necessary to create a program using Control FPWIN Pro7.

Connectable units

- Input / Output Unit
- Analog Input / Output Unit
- Temperature Input Unit
- High-speed Counter Unit
- Pulse Output Unit
- Multi Input / Output Unit
- Programmable Input / Output Unit
- PHLS (Remote I/O) Unit


dedicated controller

Existing equipment

Display device

Ethernet

Data cannot be obtained.

Display device

Ethernet

Existing equipment

Dedicated controller

Data cannot be obtained.
IoT in production operations

Realizes demand monitoring in large plants

* There are certain restrictions such as the maximum number of connectable units.

**Before** For use in small stores or for partial demand monitoring

- Our previous product featured a small number of control points, and its applications were limited to use in small stores or monitoring of partial demand in factories.

**After** Small-/medium-size factories and large plants

- By sharing receiving-point demand information through the network, entire factory loads can be optimally controlled.

**Use of the program function** enables collection of data from other manufacturers’ units that use different protocols.

*Note: To use the program function, it is necessary to create a program using Control FPWIN Pro7.*
Example of system configuration – For power peak-cut and operation monitoring

(1) Measurement of power demand
(2) Demand monitoring at intervals of several seconds
(3) Collection and storage of production / power information
(4) Acquisition of production information from PLC and energy information collected by ELC500 Control Unit through Ethernet
(5) Sharing of demand information via Ethernet and providing demand control
(6) Collection of information from ELC500 Control Unit via Ethernet
(7) Demand monitoring at intervals of several seconds using Web server
(8) Compilation, analysis and sharing of information by linking with EnerVisualizeR

Note: Screen must be created using Control Web Creator.

Related products

Programmable Controller FP0H series
KW1M-H Eco-POWER METER
KW2G Eco-POWER METER
Digital Signage Software EnerVisualizeR
Remote I/O Unit
Air Flow Monitor EWA2
Control FPWIN Pro7
Software for entering settings for data collection / storage, demand monitoring / control, email, etc. in ELC500 Control Unit

- Configurator EL500 can be downloaded free from the Panasonic website (member registration is required).
- SD / SDHC memory card must be purchased separately. Use of Panasonic’s industrial SD memory card (SLC) is recommended.

**Easy setting**

**Setting flow**

1. Registration of connected devices
2. Registration of data to be collected
3. Transfer of settings file

**Connection of ELC500 to PC**

**Examples of typical screens**

**Registration of data storage devices**
Used to register devices that collect data. Maximum of 512 points can be registered.

**Demand monitoring / control setting**
Used to set demand type and file and enter alarm output control setting.

**Current value monitor**
Monitors the storage device and main unit status. This screen is useful for checking equipment operations in startup.

**Items necessary for demand control setting**

- Demand type setting  
- Target demand setting  
- Demand monitoring device setting  
- Remote I/O unit control setting

**Control Web Creator**

This is a graphics creation tool that allows you to easily design Web content that is published by the ELC500 Control unit. You can creatively design content by arranging Web components such as switches, lamps and meters on the screen and then setting the properties. You can link your content to information in the ELC500 without any knowledge of HTML.

- Same style of operation as the program display image creation tool.
- Components can be resized without reduction in quality.
- Components can be arranged by dragging and dropping.
- Detailed component settings are easy using properties.
- Images can be pasted in.
## Main unit specifications

### External memory specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported media</td>
<td>SD memory card</td>
</tr>
<tr>
<td>Compatible format</td>
<td>-</td>
</tr>
<tr>
<td>Capacity</td>
<td>2 to 32 GB</td>
</tr>
<tr>
<td>Speed class</td>
<td>Class 2 to Class 10</td>
</tr>
</tbody>
</table>

Notes:
1) If a (momentary) power outage occurs during writing, data can become corrupted. Use of UPS (Uninterruptible Power Supply) is recommended.
2) Use of Panasonic’s industrial SD memory card (SLC memory card) is recommended.
3) For the handling of SD memory card, see the User’s Manual for ELC500 Control Unit.

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## Main specifications

### Communication (Downstream communication)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>1 port [supported protocols: MEWTOCOL-COM, Modbus TCP, number of nodes: 197 units, number of simultaneous connections: 20]</td>
</tr>
<tr>
<td>RS-232C</td>
<td>1 port [supported protocols: MEWTOCOL-COM, Modbus RTU, general-purpose communication]</td>
</tr>
<tr>
<td>RS-485 / 422</td>
<td>2 ports [supported protocols: MEWTOCOL-COM, Modbus RTU, PLC link, general-purpose communication]</td>
</tr>
</tbody>
</table>

### Data collection (Logging) function

- Stored data: Instantaneous values, differential values
- Data storage location, storage format: SD / SDHC memory card, CSV file format
- Maximum number of registerable points: 512 points/16 files (Up to 16 files can be registered. Up to 128 points can be registered in 1 file.)
- Number of storable files: 100 files

### Demand monitoring function

- Demand type: Constant-cycle (15 / 30 / 60 min) demand; demand cycle: 5 sec (high speed)/min, IEC demand (Note 1) (demand / interval time span: 1 to 60 min)
- Total number of demand monitoring target units: 50 units
- Number of registerable I/O control devices / control patterns: 16 points / alarm-linked control, startup control, cyclic control (ON/OFF control for all) (Note 2)
- Total number of demand monitoring target units: 50 units
- Number of registerable points: 512 points / 16 files (Up to 16 files can be registered. Up to 128 points can be registered in 1 file.)

### Network function

- Communication protocols: TCP/IP, UDP/IP
- Application protocols: SMTP, (SMTP AUTH supported), FTP (client / server), SNTP, DHCP, DNS, HTTP (server)

### Email transmission function

- Number of registerable points: 16 points
- Subject title: 64 half-width characters (32 full-width characters), Message: 256 half-width characters (128 full-width characters)

### Others

- Web server function: Custom Web region, 8 MB (Control Web Creator is required), number of simultaneous sessions: 16
- Extension function: Addition of FFP (PLC) units enables acquisition of information such as I/O signals, analog data and temperature data. Maximum of 8 units (Note 3)
- Program function: 32-k steps. Programming is possible when Control FPWIN Pro7 is used.

Notes:
1) Demand in compliance with IEC 61557-12. "Performance measuring and monitoring devices (PMD)"
2) Use ECOnect series remote I/O units (UEN2040R12).
3) The number of connectable units is limited. For details, refer to the ELC500 Control Unit Specifications or manual.

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## Dimensions (Unit: mm in)

<table>
<thead>
<tr>
<th>Status indication LED</th>
<th>Mode selector switch</th>
<th>Card cover</th>
<th>USB port</th>
<th>LAN port</th>
<th>DIN hook</th>
<th>End unit</th>
</tr>
</thead>
</table>
| COM1 / COM2 port terminals | M2 screw tightening torque: 0.22 to 0.25 Nm
| COM0 port terminals | M2 screw tightening torque: 0.22 to 0.25 Nm |

Tolerance: ±1.0

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Panasonic Corporation
Electromechanical Control Business Division
1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/

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* This product includes software developed by the IEEE Industry Connections Security Group (ICSG)

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